NIA | National Insulation Association

Grand Hyatt Baha Mar
Nassau, Bahamas

Making a Difference

APRIL 3–5
2019

NIA's 64th Annual Convention

THE ENERGY & H_20 NEXUS

SCOTT MILLER, DIRECTOR SUSTAINABILITY AND PRODUCT AFFAIRS

KNAUF INSULATION NORTH AMERICA

NIA 64TH ANNUAL CONVENTION

REFERENCES

- HTTPS://WATER.USGS.GOV/WATUSE/WUGLOSSARY.HTML
- MECHANICAL INSULATION IN HOSPITALS AND SCHOOLS, CHRISTOPHER P. CRALL, RONALD L. KING, NATIONAL INSULATION ASSOCIATION, SEPTEMBER 1, 2011
- HTTPS://WWW.UCSUSA.ORG/CLEAN_ENERGY/OUR-ENERGY-CHOICES/ENERGY-AND-WATER-USE/FRESHWATER-USE-BY-US-POWER-PLANTS.HTML (UNION OF CONCERNED SCIENTISTS)
- FAITHFUL & GOULD FOR PACIFIC NORTHWEST LABORATORY, RESIDENTIAL ENERGY EFFICIENCY MEASURES, PROTOTYPE ESTIMATE AND COST DATA REVISION 6.0, JUNE 29, 2012

INSULATION DOES SO MANY THINGS!

- SAVES ENERGY USE
- REDUCES CARBON EMISSION
- PRESERVES RESOURCES FOR FUTURE GENERATIONS
- IMPROVES COMFORT
- SAVES MONEY
- SAVES WATER

Water???

Yes water, Lots of it!

IF YOU HAD TO MAKE A CHOICE?

WATER AND SUSTAINABILITY

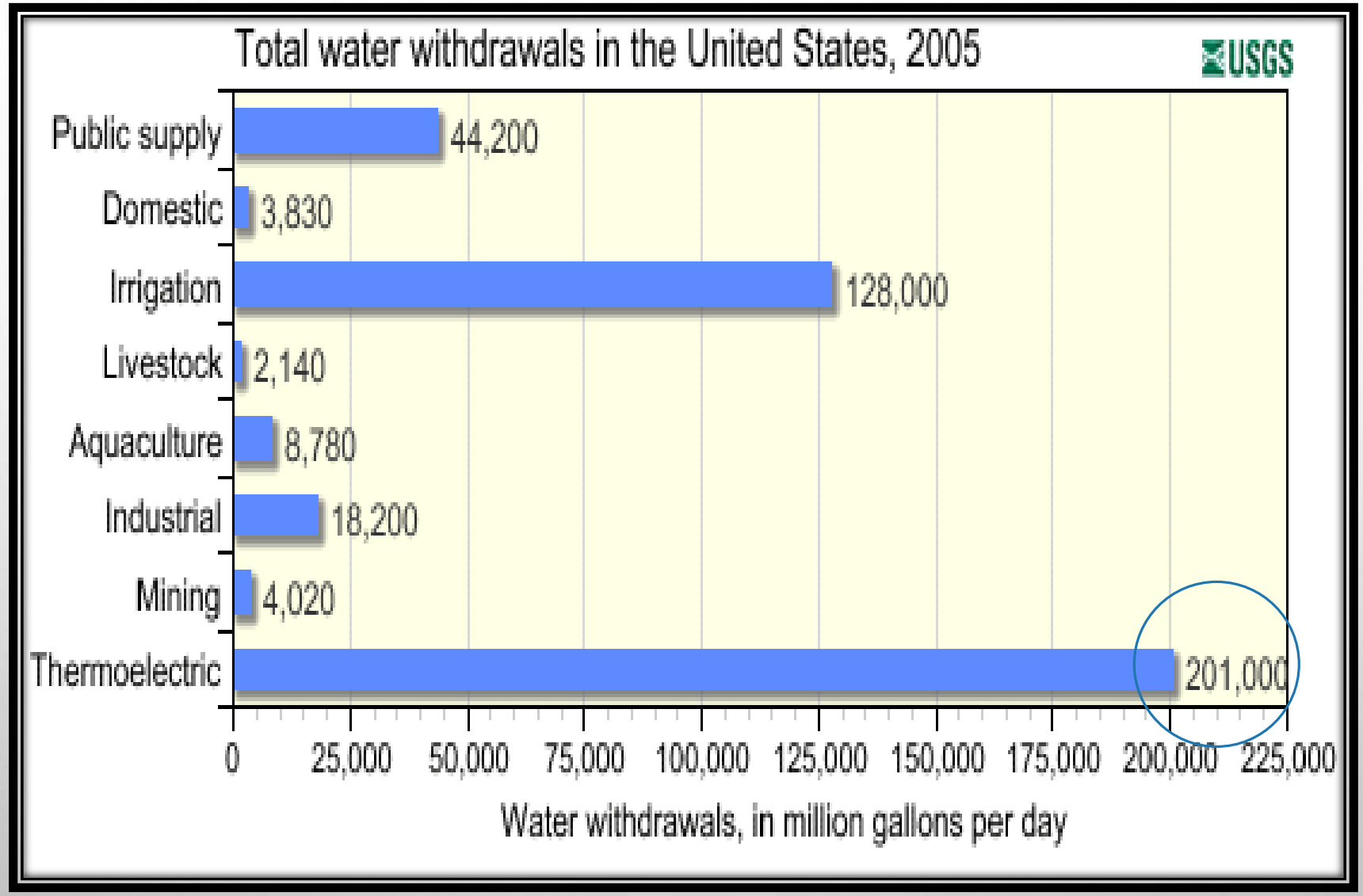
THINK ABOUT A WORLD WITHOUT H_2O

THE CIA SAYS:

Water shortages occurring in combination with other sources of tension-such as in the Middle East-will be the most worrisome. As some countries press against the limits of available water between now and the future, the possibility of conflict will increase.

One recent UN report projected that two-thirds of the people in the world will be dealing with "water stress" and 1.8 billion people will be facing "absolute water scarcity" by the year 2025.


What one thing uses the most water?


Total water withdrawals in the United States, 2005
USGS
Public supply
44,200
Domestic
3,830
Irrigation
128,000
Livestock
2,140
Aquaculture
8,780
Industrial
18,200
Mining
4,020
Thermoelectric
201,000
0
25,000
50,000
75,000
100,000
125,000
150,000
175,000
200,000
225,000
Water withdrawals, in million gallons per day

INSULATION IMPACT

- On Average, In United States Two Gallons Of Water Are Evaporated For Every Kilowatt-hour (KWh) Of Electricity Produced By Hydroelectric And Thermoelectric Stations. (The Environmental And Energy Study Institute)
- 1.8 Trillion Gallons of Water Could be Saved (2005-2020) in the Implementation of Energy Efficiency Best Practices in the Region (Western Governors Association CDEAC)

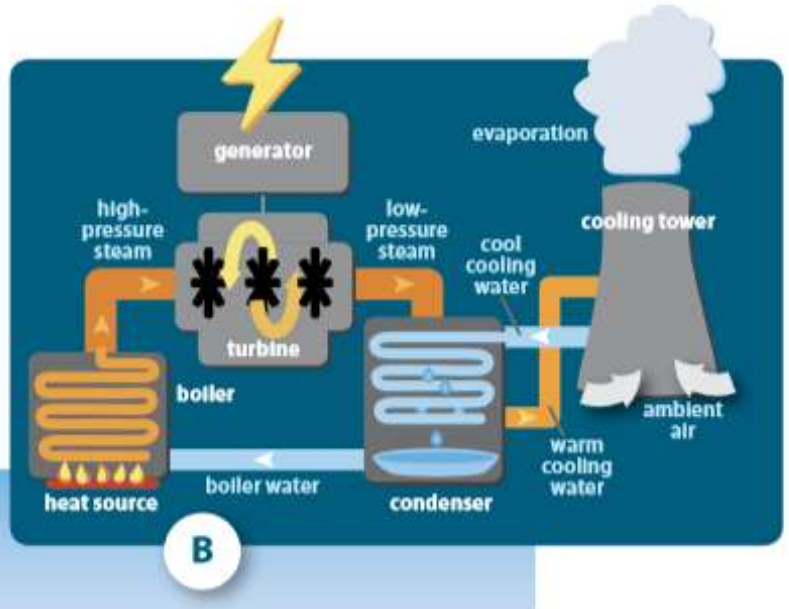
Freshwater Use by U.S. Power Plants

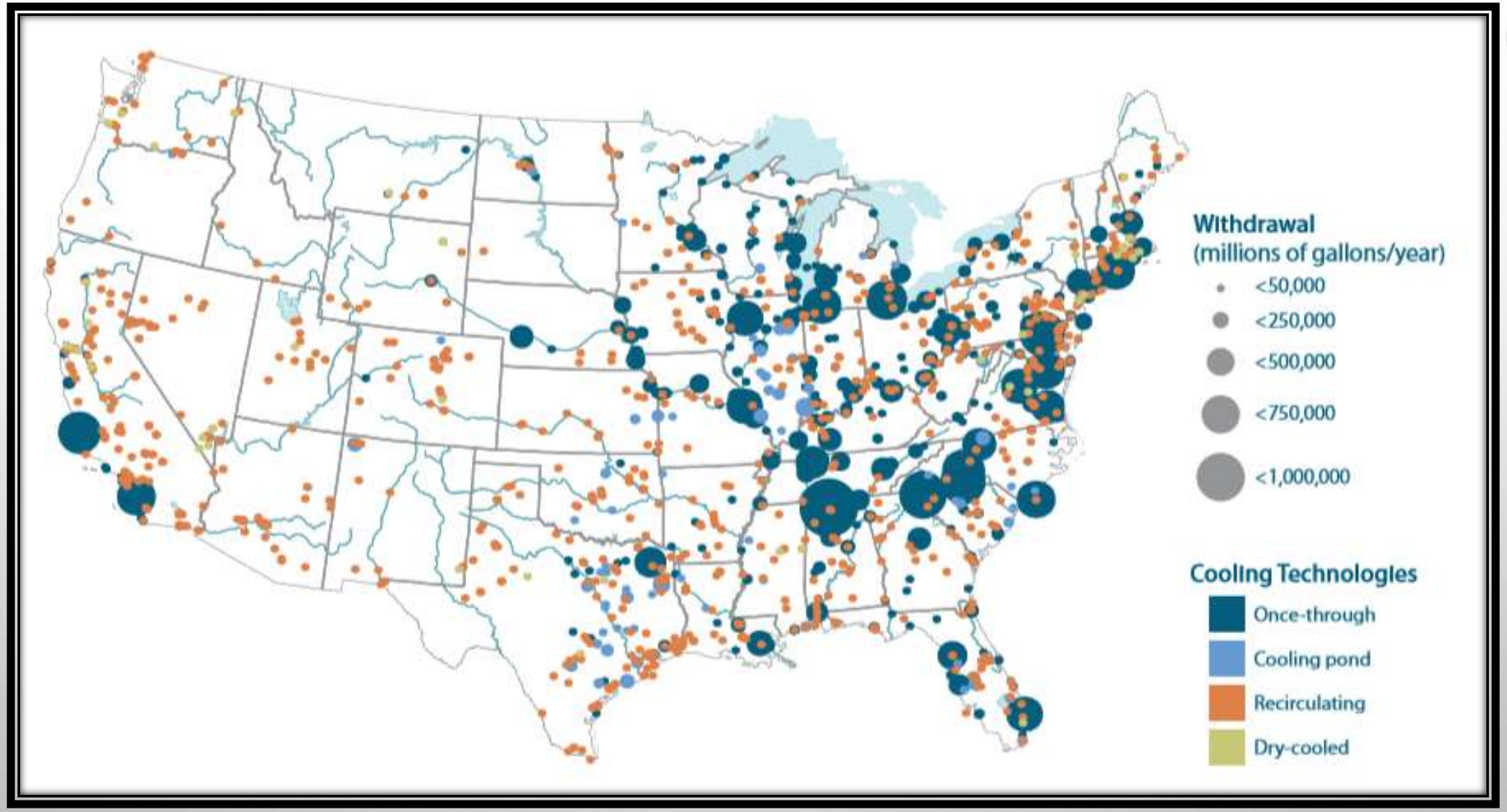
ELECTRICITY'S THIRST FOR A PRECIOUS RESOURCE

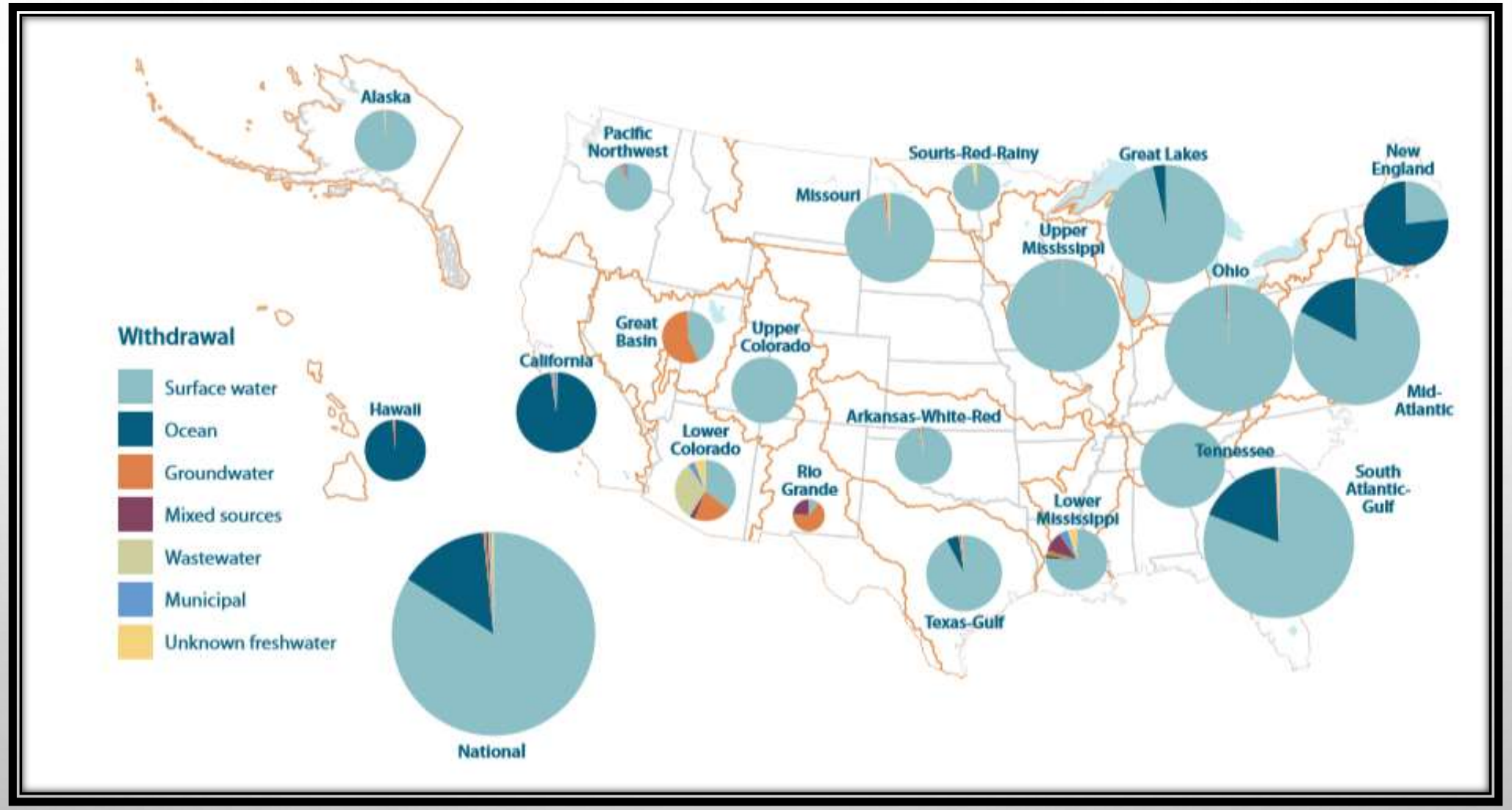
FIGURE 1. How Power Plants Use Water

Most U.S. power plants create steam to drive the turbines that generate electricity. After the steam passes through a turbine, it is cooled, condensed, and reused. Steam cooling accounts for virtually all the water that most power plants use, which they often draw from rivers, lakes, or aquifers. How much water a power plant uses depends on which cooling technology it uses. Once-through cooling systems (A) withdraw large amounts of water, but return most of it—at a higher temperature—to the source. Recirculating systems (B) take in much less water, but can consume twice as much of it or more, because they evaporate much of the water to condense the steam.

Inset adapted from GAO 2009.




Withdrawal
(millions of gallons/year)
<50,000
<250,000
<500,000
<750,000
<1,000,000
Cooling Technologies
Once-through
Cooling pond
Recirculating
Dry-cooled


Withdrawal
Surface water
Ocean
Groundwater
Mixed sources
Wastewater
Municipal
Unknown freshwater
Alaska
Hawaii
National
Pacific Northwest
Missouri
Souris-Red-Rainy
Great Lakes
New England
Upper Mississippi
Ohio
Great Basin
Upper Colorado
California
Mid-Atlantic
Arkansas-White-Red
Lower Colorado
Rio Grande
Tennessee
South Atlantic-Gulf
Lower Mississippi
Texas-Gulf

INSULATION SAVES WATER !

- A LOT OF IT ! TO DEMONSTRATE THAT:
- 2 SCENARIOS
  - WATER SAVINGS CALCULATED FOR INSULATION IN A WALLS AND CEILING OF A HOME
  - WATER SAVINGS CALCULATED FOR PIPE INSULATION IN A HOSPITAL

FAITHFUL+GOULD

FOR

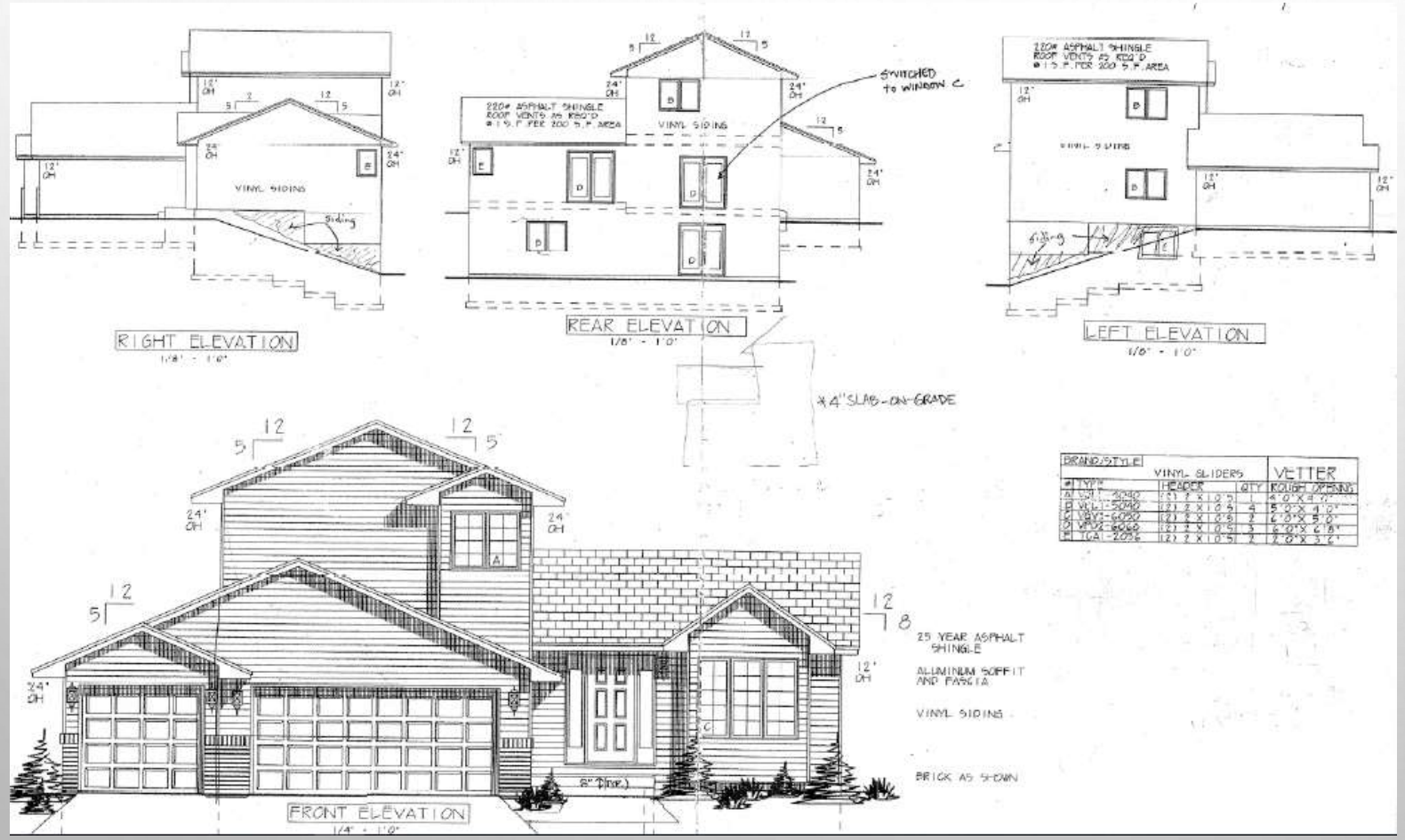
PACIFIC NORTHWEST NATIONAL LABORATORY

Residential Energy Efficiency Measures

Prototype Estimate and Cost Data

2nd March 2012

MEDIAN HOME 2115 SF



FAITHFUL+GOULD
FOR
PACIFIC NORTHWEST NATIONAL LABORATORY
Residential Energy Efficiency Measures
Prototype Estimate and Cost Data
2nd March 2012

MEDIAN HOME ENERGY SAVINGS

Table 9: Primary energy demand (PED) comparison of a building with and without insulation*

Wall Insulation R-value	Ceiling Insulation R-value	Total annual PED for the home from heating and cooling [MJ]	Total annual energy saved via insulation [MJ]	Insulation life cycle PED [MJ]	Time to recover PED of insulation [days]
None	None	203,000	None	N/A	N/A
R-13	R-38	105,000	97,400	12,700	47
R-15 HD	R-38	103,000	100,000	17,900	65
R-19	R-38	96,500	106,000	12,700	44

= 27,055 KWH

MEDIAN HOME WATER SAVINGS INSULATION

20755 x 2 gallons / kwh = 54,111 gallons of water saved

120 million single family homes

= 6,493,320,000,000

EXAMPLE FOR PIPE INSULATION (HOSPITAL)

- MECHANICAL INSULATION IN HOSPITALS AND SCHOOLS, CHRISTOPHER P. CRALL, RONALD L. KING, NIA, **SEPTEMBER 1, 2011**
- I CALCULATED THE HEAT LOSS OR GAIN FOR ALL OF THE PIPE SIZES LISTED USING THE NAIMA 3E'S SOFTWARE, USING THE OPERATING TEMPERATURES LISTED IN THE STUDY.

HOSPITAL EXAMPLE

341,573,258

Gallons of water saved annually by pipe insulation in an average hospital

HOW MANY HOSPITALS ARE THERE?

6210 in the U.S. x 341,573,258 gallon per hospital=

2,121,169,932,180 gallons saved

CONCLUSIONS

- FROM A BUSINESS PERSPECTIVE SHOULD THIS BE PART OF THE INSULATION INDUSTRY'S NARRATIVE? ABSOLUTELY!
- DOES THAT NARRATIVE OFFER BUSINESS OPPORTUNITY? YES
- THIS TOPIC DESERVES MORE STUDY…….TO MORE DEFINITIVELY ANSWER THAT QUESTION

REFERENCES

- HTTPS://WATER.USGS.GOV/WATUSE/WUGLOSSARY.HTML
- MECHANICAL INSULATION IN HOSPITALS AND SCHOOLS, CHRISTOPHER P. CRALL, RONALD L. KING, NATIONAL INSULATION ASSOCIATION, SEPTEMBER 1, 2011
- HTTPS://WWW.UCSUSA.ORG/CLEAN_ENERGY/OUR-ENERGY-CHOICES/ENERGY-AND-WATER-USE/FRESHWATER-USE-BY-US-POWER-PLANTS.HTML (UNION OF CONCERNED SCIENTISTS)
- FAITHFUL & GOULD FOR PACIFIC NORTHWEST LABORATORY, RESIDENTIAL ENERGY EFFICIENCY MEASURES, PROTOTYPE ESTIMATE AND COST DATA REVISION 6.0, JUNE 29, 2012
- 3E'S SOFTWARE
- REM DESIGN 14.0 SOFTWARE
- CIA WORLD FACTBOOK

Thank you!